Tracts 1481. (1.)

ON THE SPONGES COLLECTED DURING THE "SKEAT EXPEDITION" TO THE MALAY PENINSULA, 1899–1900.

By IGERNA B. J. SOLLAS, B.Sc. (Lond.), Bathurst Student, Newnham College, Cambridge.

[*From the* Proceedings of the Zoological Society of London, June 17, 1902.]

14 NOV 17

3L

Tracts 1481 ①

[*From the* PROCEEDINGS OF THE ZOOLOGICAL SOCIETY OF LONDON,
June 17, 1902.]

On the Sponges collected during the "Skeat Expedition" to the Malay Peninsula, 1899–1900. By IGERNA B. J. SOLLAS,[1] B.Sc. (Lond.), Bathurst Student, Newnham College, Cambridge.

(Plates XIV. & XV.[2])

These Sponges were kindly entrusted to me for description by Dr. S. F. Harmer, F.R.S. They were obtained by Mr. R. Evans, of Oxford, by shore-collecting in two localities:—"(i) Pulau Bidang, one of the Nine Islands group, off the coast of Kedah on the west coast of the Malay Peninsula, running N.E. from the Island of Penang; (ii) Great Redang coral islands off the coast of Trengganu State (S. of 5° 50′ N.), which again is S. of Kelantan, the largest of the East-coast States." Thus, being a shore collection, the majority of the species represented in it belong to the group Monaxonida; the remainder are Tetraxonia and Keratosa.

In dealing with the representatives of the simpler Monaxonida I have contented myself with mere description, leaving the species undetermined. In the present state of classification of these species this seems to be the only satisfactory course open to any worker not prepared to make an exhaustive study of all the species of a genus.

MONAXONIDA.

1. RENIERA sp. (Plate XIV. fig. 5.)

Sponge growing on the back of a crab, of which it conceals completely the dorsal view.

Consistency gelatinous. Measuring from 1 to 2 cm. across.

Spicules slightly bent oxeas, 0·075–0·090 × 0·003–0·004 mm.

Spongin abundant at the nodes of the spicular network. The mesh is square. Single spicules project vertically from the dermal membrane.

In one of the two specimens in the collection, but not in the other, there are a few multispicular strands in the otherwise very regular unispicular meshwork.

Pulau Bidang and Great Redang.

2. RENIERA sp. (Plate XV. fig. 11.)

Sponge encrusting, growing on an encrusting Polyzoon and forming a thin sheet from 1–2 mm. in thickness. Oscula numerous, with raised margins, almost regularly arranged at distances of 5 mm. from one another. Pores large, conspicuous.

---

[1] Communicated by Dr. S. F. HARMER, F.Z.S.

[2] For explanation of the Plates, see p. 221.

Skeleton composed of multispicular main fibres connected by a unispicular network. The main fibres run vertically, and their projecting distal ends raise the dermal membrane into small prominences.

Spicules, oxeas with gradually tapering ends or with rounded end from which a short point projects, 0·12–0·13 × 0·007–0·008 mm.

Great Redang.

3. Reniera sp.

A pink sponge forming irregular encrusting lobes. Oscula about 1·5–2 mm. in diameter.

Skeletal network with one or two spicules to the mesh. Dermal membrane smooth, pores fairly conspicuous.

Oxeas 0·10–0·11 × 0·0056 mm.

Embryos are present in the basal parts of the sponge, having a skeleton of scattered fine oxeate spicules.

Pulau Bidang.

4. Reniera sp.

Sponge ear-shaped, encrusting, thickest in the neighbourhood of the single large osculum, which is marginal. Compact, brittle. Colour, when fresh, grey.

Dermal membrane smooth. Pores visible, largely in rows. Main fibres multispiculate; spongin fairly plentiful.

Oxeas 0·098 × 0·002 mm. to 0·13 × 0·007 mm.

Pulau Bidang.

5. Reniera sp. (Plate XV. fig. 3.)

Two small fragments of a sponge of gelatinous consistency. Colour pinkish grey. Oscula from 1–3 mm. in diameter. Surface smooth, pores not obvious.

Spongin abundant, forming considerable swellings at the nodes of the unispicular mesh and occasionally completely enveloping the spicules along their whole length.

"Reniera filaments" and "chaplets" are present.

Spicules slender oxeas with somewhat blunt points, 0·08–0·09 × 0·003 mm.

Great Redang.

6. Reniera sp.

Sponge consisting of creeping branches attached at intervals, sometimes 5 mm. thick, sometimes forming quite a thin crust. Texture compact and resistant. Oscula 2 mm. in diameter with slightly raised thin margins.

Mesh unispicular, with some stout multispicular strands, having as many as 8–10 spicules on a cross section. Dermal membrane smooth, rather easily detached.

Oxeas bent, stout, 0·87–0·94 × 0·005 mm.

Pulau Bidang.

The specimen is bottled with two specimens (♂ & ♀) of a decapod crustacean without remark, presumably they were found sheltering under it.

7. Reniera sp.

Sponge tubular, creeping, branching and again anastomosing, swollen at intervals where it bears oscula of about 2 mm. in diameter. Pores large, conspicuous, and fairly evenly distributed.

The skeleton is rather irregular, with multispicular strands connected by a network which is not at all uniform, being either uni- di- or tri-spicular. The multispicular fibres raise the dermal membrane into minute conuli.

The tissues are permeated with black pigment-containing cells, which have a number of refractive granules over their surfaces.

Oxeas 0·14 × 0·007 mm.

Pulau Bidang.

8. Gellius centrangulatus, n. sp. (Plate XV. fig. 6.)

Sponge massive, fragile, attached by a broad surface. Dermal membrane easily removed. Oscula (?) in rows.

Skeleton a regular unispicular network with rather abundant yellow-brown spongin at the nodes. The spongin occasionally completely invests the spicules of the net. Here and there multispicular strands occur.

The interest of the species lies in its microscleres: besides sigmata of the usual form it possesses others with a central bend giving them an appearance very like that of a centractinate sigma that may perhaps be termed centrangulate (Pl. XV. fig. 6). These curious bow-like sigmata recur in *G. sagittarius* (Pl. XV. fig. 7)[1].

Oxeas 0·22 × 0·007 mm. The oxeas show frequent abnormality in that they bear lateral branches.

Sigmata 0·016–0·0195 mm. Centrangulate sigmata 0·0195 mm.

Great Redang.

9. Gellius sagittarius, n. sp. (Plate XV. fig. 7.)

Sponge attached, consisting of a more dense basal part and of numerous slender tubes arising from this.

In one specimen these tubes anastomose; in the second they are broken off and show no indication of how they were arranged.

Skeleton a more or less irregular network of oxeas, becoming especially so in the lower part of the sponge, where the arrangement of spicules is almost halichondroid.

Oxeas 0·3–0·35 × 0·01–0·013 mm.

Abnormalities among the oxeas are striking by their frequency. They consist in the possession of small branches at one end of the spicule, sometimes a single one is borne laterally, or there may be 3 or 4 or more pointing in various directions or forming a regular tuft.

---

[1] Since this paper was read the translation of Lundbeck's essay on the Sponges of the Danish Ingolf Expedition has appeared. Similar sigmata are there figured and described in *Gellius luridus*, n. sp.

Sigmata 0·012–0·016 mm.; centrangulated sigmata 0·016 mm.
Toxa: arms 0·025, 0·016; length 0·049 mm.
Pulau Bidang.

10. ESPERELLA SULEVOIDEA, n. sp. (Plate XIV. figs. 8 & 9 and Plate XV. fig. 10.)

Sponge creeping, attached at intervals, the attached parts forming thin disks.

The skeleton consists of short stout fibres of styles rising from the surface of support and almost at once breaking up into 3 or 4 compact branches which run to the dermal membrane, through which they pass, their ends forming little hispid patches on the surface which are visible to the naked eye. The dermal membrane contains a network formed of compact multispicular fibres. In the meshes of this main framework lie the various forms of microscleres. The rosettes of anisochelæ are mostly confined to the superficial parts of the sponge.

Spicules:—

Tylostyles, with but slightly marked head, and with a peculiar undulating outline: 0·360 × 0·012 and 0·360 × 0·006 mm.
Sigmata 0·06–0·08 × 0·006 mm.
Toxa 0·5–0·14 mm.
Anisochelæ in rosettes, 0·05–0·06 mm.
Anisochelæ scattered, 0·033 mm.; 0·012 mm.

11. BIEMMA DEMOCRATICA, n. sp. (Plate XV. fig. 9.)

Sponge growing on a Lamellibranch shell and forming very thin encrusting sheets. The microscleres are in striking predominance over the megascleres, which might almost pass unnoticed. The microscleres are sigmata of many sizes, ranging from 0·01 to 0·08 mm.; they are frequently fascicled, and in this case they may be either linear or, as is more commonly the case, they may be of the same thickness as solitary sigmata of the same length. The few megascleres are tylostyles often bent rather sharply just below the head, or sometimes with a second swelling immediately succeeding the head.

Tylostyles 0·18 × 0·0025, head ·005; 0·26 × 0·06, thickness of head ·008; 0·56 × 0·006 mm., thickness of head 0·009 mm.
Sigmata 0·08 × 0·003 mm. to 0·01 linear.

I have included this species in the genus *Biemma* with some hesitation. Possibly it ought to form the type of a new genus.

Pulau Bidang.

12. DESMACELLA FORTIS Topsent.

Desmacella fortis Topsent, Revue Suisse de Zoologie, iv. 1896–7.

With this species from the Red Sea and Bay of Amboina are identified two specimens differing somewhat in external features. Each is greyish in spirit, but has coloured the spirit in one case violet, in the other pink.

The chief difference between the specimens is in the size and position of the oscula. In the violet-coloured specimen (which is also the larger, measuring 8 cm. in height and 26 cm. in circumference, while the pink sponge is 7 cm. in height and 10 cm. in circumference) the oscula agree with Topsent's description. They are large—3–6 mm. in diameter,—confined to the upper surface of the sponge, and sometimes at the end of chimney-like projections which only need to fuse laterally with one another in order to give Topsent's dorsal crest. In the pink sponge the oscula are no more than 2 mm. in diameter, and are scattered on all the free faces of the sponge and lie quite level with the general surface.

Both specimens seem to have incorporated in themselves any foreign bodies lying on them. The canals of both are inhabited by 6-rayed Ophiuroidea in various stages of fission, or rather of regeneration following fission, one half of the disk and three arms being of much smaller size than the remaining three[1].

Styles 1·0–1·3 mm. × 0·04–0·047 mm. at their widest parts.

Sigmata 0·01–0·11 × 0·0055 mm., with many (10–12 were measured) intermediate sizes, differing in this latter particular from Topsent's description.

Trichodragmata 0·140 mm.

DESMACELLA sp.

Sponge about 15 mm. × 6 mm.

Probably a young specimen of *D. fortis* Tops.

Styles 1·05 × 0·03 ; 0·608 × 0·005 mm.

Sigmata 0·016–0·089 × 0·006 mm., with a few intermediates.

Trichodragmata 0·133 mm.

13. CIOCALYPTA MELICHLORA, n. sp. (Plate XIV. fig. 1 and Plate XV. fig. 8.)

The single specimen of this species is broken into about 20 pieces. It must have measured about 20 cm. in breadth and as much in height, and have consisted of a massive basal part breaking up distally into many flattened processes. Fortunately two of these processes have been preserved separately and are in a better condition. They show that the sponge possesses the structure formerly considered to be one of the diagnostic characters of the genus (for Thielé's views see Abh. Senckenb. Ges. xxv. 1900, p. 17); it has a central axis, in which the spicules run longitudinally; from this arise short columns containing spicules placed at right angles to the central axis and supporting the dermal membrane above a spacious subdermal cavity.

Colour in spirit whitish.

Spicules:—

Oxeas in great variety of size and form (Pl. XV. fig. 8), often inequiactinate, the large oxeas very broad in the middle and tapering gradually to fine points. They may be bent once or twice.

---

[1] See Bateson, 'Materials for the Study of Variation,' p. 433; and Lütken, Ann. & Mag. N. H. 1873, ser. 4, vol. xii. p. 323 (quoted by Bateson).

Oxeas 0·94 × 0·04 to 0·35 × 0·03 mm.; oxeas bent twice, 0·28 × 0·06 mm.

Styles 0·70 × 0·34 mm., occasional.

Still rarer are tornotes 0·88 × 0·032 and 0·56 × 0·02 mm.

Both the stoutest and the slenderest spicules are confined to the axis.

Pulau Bidang.

14. Ciocalypta rutila, n. sp. (Plate XIV. fig. 7.)

Sponge small, 25 × 8 mm.; very fragile, transparent, of a golden-brown colour.

Like that of *C. melichlora* just described, the structure is that typical of the genus in its narrower sense (Ridley & Dendy, Voyage of H.M.S. 'Challenger,' vol. xx. p. 173).

The axial column is of very light build, spongy and cavernous. The dermal membrane like that of *C. hyaloderma* (Ridley & Dendy, loc. cit. p. 174) is marked with little stars where the pillars of supporting spicules meet it.

Oxeas, with a few styles, 0·98 × 0·02 mm.

Pulau Bidang.

15. Tethya ingalli Bowerb.

Tethya ingalli Sollas, Voyage of H.M.S. 'Challenger,' vol. xxv. p. 431, pl. xliv.

Sponge spherical, attached, surface even. Cortex fibrous throughout, about 1 mm. thick, without intercortical cavities. Pores leading into narrow canals. Oscula similar to the pores.

Megascleres: Strongyloxeas 1·76 × 0·035; 1·40 × 0·03 mm.; 0·32 mm.; slender, abundant.

Microscleres: Spherasters 0·060–0·012 mm. Chiasters variable, 0·012 mm. Oxyasters 0·030–0·024 mm.

Kirkpatrick (P. Z. S. 1900) compares the spicule measurements of Christmas Island, Fremantle, and 'Challenger' specimens thus:—

	Strongyloxea.	Spheraster.	Chiaster.	Oxyaster.
Christmas I. ……	1·36 × 0·024	0·070	0·012	0·018–0·024
Fremantle ………	1·47 × 0·035	0·070	0·012	0·036
'Challenger' ……	1·6–1·7 × 0·026–0·032	0·065–0·085	0·012–0·016	0·035–0·043

to which we may add

'Skeat' …………	1·4–1·76 × 0·03–0·035	0·060–0·012	0·012	0·024–0·030

The specimen is gemmiferous, bearing several very young gemmules and one comparatively advanced (8 mm. in diam.), sunk in the parent tissues. In this gemmule microscleres resembling those of the adult are absent, but a number of globules are present—varying in size, the largest being 0·02 mm. in diameter. The largest globules are thus a little smaller than the centrum of the largest spheraster of the adult, and I supposed that the globule was the young stage of a spheraster. Since coming to this conclusion I have seen Maas's paper (SB. Akad. Wiss. München, 1900, pp. 553–569). Maas describes the origin of spherasters from a pair of small calthrops, and I am hence at a loss to account for the globules unless we may suggest that the spherasters have more than one mode of origin.

Great Redang.

16. TETHYA MAZA Sel.

Tethya maza Selenka, Zeitschr. f. wiss. Zool. xxxii. p. 472, pl. xxviii. (1879); Sollas, Voy. H.M.S. 'Challenger,' vol. xxv. p. 440.

Sponge hemispherical. The curved surface is raised into low, more or less hexagonal bosses. In the depression between the raised areas are the pores leading into extensive, very regularly arranged, intercortical cavities.

The cortex is fibrous only in its inner part. Oscula absent or not distinguishable from the pores. Colour in spirit greyish white. Diameter of circular base 12 mm. The specimen is not gemmiferous.

Megascleres: Strongyloxeas 1·20 × 0·025 ; 0·8 × 0·013 mm.

Microscleres: Spherasters of many sizes, the maximum diameter is 0·056 ; centrum 0·025 mm.

Chiasters abundant in the dermal membrane and occurring also in the choanosome, 0·009–0·012 mm.

Oxyasters 0·025–0·031 mm.; actines slender, beset with spines so low as to be mere roughenings. These microscleres often have only 6 rays lying in 3 axes at right angles ; in this case one pair of rays is longer than the other two pairs, which are equal to one another.

Pulau Bidang.

17. HYMEDESMIA HALLEZI Topsent.

Hymedesmia hallezi Topsent, Arch. de Zool. Exp. (3) t. viii. p. 119 (1900).

Sponge growing on a lamellibranch shell together with *Samus anonymus*.

Besides the spicules of the vertical bundles which rest with their oval heads in contact with the surface of support, other more slender tylostyles lie horizontally. The microscleres are distributed uniformly. They are asters of which the slender rays are swollen at the tips. There is a distinct centrum somewhat sharply marked off from the rays. They thus differ to a certain extent from those of the type ; but as Topsent mentions that the rays of the spherasters of *H. hallezi* sometimes end in a "*petit bouton non élargi*," this difference is probably unimportant.

Vertical tylostyles 0·6–0·88 × 0·01 mm.

Horizontal tylostyles 0·50 × 0·002–0·003 and 0·56 × 0·007.

Pulau Bidang.

18. SPIRASTRELLA INCONSTANS Dendy. (Plate XIV. fig. 3.)

Spirastrella inconstans Thiele, Studien über pacifische Spongien, Zoologica, xxiv. ii. p. 10, pls. 1 & 5.

A single specimen with the note: "a grey sponge from between the stones between tide-marks. *Loc.* Pulau Bidang, *R. Evans*."

The identification has been made on the evidence of spicules alone. If it should be correct, the specimen affords yet another example of the extraordinary variety in outward form of this species. The sponge is a simple tube attached below to a small pebble, with the single osculum at its free end. The surface is even.

The skeleton is formed of stout fibres of tylostyles running obliquely to smaller tylostyles projecting vertically to the surface. In the ectosome spirasters are sparsely distributed: they are not present in the interior of the sponge.

Tylostyles of the main skeleton 0·570 × 0·025 to 0·30 × 0·01 mm.

Tylostyles of the ectosome 0·24 × 0·01 mm.

Spirasters: length 0·02–0·03 mm.; average number of bends 3; number of spines to each bend 3–5.

Pulau Bidang.

19. SUBERITES LAXOSUBERITES, n. sp. (Plate XV. fig. 4.)

Sponge encrusting, 1–4 mm. in thickness. Oscula not visible. Colour in spirit whitish. Surface even, slightly hispid.

The skeleton consists of short ascending and diverging fibres of styles and of small styles in the ectosome projecting at the surface.

Thus this species combines the fibrous arrangement of the styles of the main skeleton—an arrangement characteristic of *Laxosuberites* Topsent (Arch. de Zool. Exp. sér. 3, t. viii. p. 184)—with the possession of an ectosomal skeleton of small styles like that of *Suberites*. Occasional tylostyles are to be found among the styles of the main skeleton.

Styles 0·70 × 0·026 to 1·12 × 0·04 mm., the breadth measured being the greatest breadth.

Styles of the ectosome 0·25 × 0·004 mm.

Tylostyles 0·70 × 0·02; breadth of head 0·01 mm.

Pulau Bidang.

20. PSEUDOSUBERITES CAVA, n. sp. (Plate XIV. fig. 6.)

Sponge encrusting, with a few outlying free lobes; transparent; rusty-brown in spirit.

The subdermal cavities are large, and as the sponge forms only a thin crust, they traverse almost its whole thickness; the sponge thus consists of two lamellæ, one attached to the substratum, the other being the dermal membrane, while columns containing bundles of spicules stretch vertically between them.

The spicules in the dermal membrane lie parallel to the surface, those in the columns on reaching the surface spread out and just extend beyond the dermal membrane.

Spicules: Styles (not tylote as in the other species of the genus), the largest measuring 0·54 × 0·012 mm.

21. TERPIOS FUGAX Duchassaing & Michelotti.

Terpios fugax Keller, Zeitschr. f. wiss. Zool. lii. p. 319; Topsent, Arch. de Zool. Exp. (3) viii. p. 193.

Sponge growing on a lamellibranch shell together with *Amorphina* sp. and *Hymedesmia hallezi*.

TETRAXONIA.

CARNOSA.

22. DERCITUS PLICATUS Topsent.

Dercitus plicatus Topsent, Arch. de Zool. Exp. (3) iii. p. 493 (1895).

Sponge growing on a valve of lamellibranch shell. Pinkish. Surface uneven.

Spicules calthrops-like microtriænes and spined microxeas; microdichotriænes absent.

The spicules have a somewhat wider range of size than those of Topsent's specimens.

Orthotriænes, cladus 0·10–0·24 × 0·015–0·027 mm.

Microxeas 0·012–0·025 × 0·002–0·003 mm., including the spines.

Great Redang.

23. DERCITUS PAUPER, n. sp. (Plate XV. fig. 1.)

Sponge pink, encrusting. The specimen is growing on a piece of dead coral skeleton; it forms a long narrow band about 50 × 5 mm. and 1 or 2 mm. thick. Surface smooth and shining. No oscula visible.

The megascleres are small dichotriænes or simple calthrops-like microtriænes (the latter spicule rare). The megascleres are sparsely distributed, contrasting with the interlocking spicules in *D. plicatus*.

Dichotriæne, protocladus 0·05–0·06 × 0·01; deuterocladus 0·03; rhabdome 0·08 mm.

Orthotriæne, cladus 0·06–0·07 × 0·003 mm.

Spined microxeas 0·015–0·02 × 0·001 mm.

Great Redang.

24. SAMUS ANONYMA Gray.

Samus anonyma Gray, P.Z.S. 1867, p. 526; Carter, A. M. N. H. ser. 5, vol. iii. p. 350 (1879); Sollas, Voy. of H.M.S. 'Challenger,' vol. xxv. p. 57.

Sponge growing on a lamellibranch shell in company with *Terpios fugax* and *Hymedesmia hallezi.*

The measurements of the spicules agree with those given in the 'Challenger' Monograph.

Pulau Bidang.

TETRACTINELLIDA.

25. TETILLA RIDLEYI Sollas.

Tetilla ridleyi Sollas, 'Challenger' Monograph, xxv. p. 48.

Sponge hemispherical; surface rough; oscula few, small, with slightly raised rims, forming an interrupted ring round the sponge. Diameter of base about 16 mm.

Oxeas 2·16 × 0·026 mm.

Protriænes, cladus 0·037–0·14 mm.

Anatriænes, cladus 0·015–0·08 mm.

The cladi when as short as 0·015 mm. are also very thick.

Sigmata 0·011 mm.

The skeleton of the walls of the oscular tubes consists of strands of the more slender protriænes and prodiænes, oxeas being absent in these parts.

The ciliated chambers are 0·02 mm. in diameter. In their present state they have very distinct "Sollas' membranes."

Pulau Bidang.

26. Cinachyra malaccensis, n. sp. (Plate XIV. fig. 2 and Plate XV. fig. 5.)

Since the description of the type species, *C. barbatus* Sollas (Voyage of H.M.S. 'Challenger,' vol. xxv. p. 23, pls. iii. & xxxix.), four new species have been added to the genus; v. Lendenfeld when he states (Abh. Senck. Ges. xxi. p. 107, 1897) that his *C. voeltzkowi* from Zanzibar is the only species found since the type, overlooks the three species described by Keller (Zeit. f. wiss. Zool. lii. p. 336, pl. xix., 1891).

The genus as now known contains the following species:—

- A. Pores confined to the porocalyces.
  - *α.* Porocalyces rough with fine hispidating protriænes.
    - *a.* With rooting spicules, with cortical oxeas, with projecting ridges on the surface of the porocalyces .... *C. barbata* Soll.
    - *b.* Without the three characters mentioned as occurring in *C. barbata.* With rhabdodragmas scattered throughout the tissues. *C. eurystoma* Keller. Red Sea.
  - *β.* Porocalyces without hispidating spicules. Microxeas throughout the tissues.
    - *a.* Porocalyces with an even surface. Sponge spherical with smooth surface. *C. schulzei* Keller. Coast of Aden and Mozambique Channel.
    - *b.* Porocalyces with a network of projecting ridges. Sponge conical. *C. trochiformis* Keller. Red Sea.
- B. Pores not confined to the porocalyces, which latter are without hispidating spicules .... *C. voeltzkowi* Lendenfeld. Zanzibar.

The present specimens agree with *C. voeltzkowi* in possessing scattered pores in addition to those of the porocalyces. The surface of the latter structures is raised into a network of fine ridges, but lacks hispidating spicules. The sigmata are smaller than in any hitherto described species.

The sponge approaches a hemispherical form; one specimen having become attached laterally is almost bracket-shaped; in the other the curved surface occupies more than a hemisphere, while the basal membrane is folded and forms a conical surface concave to the exterior.

The porocalyces are either cup-shaped or shell-shaped, in the latter case as much as 3 mm. in diameter.

The cortex is a uniform fibrous collenchyma; canals passing through it from the scattered pores are clearly marked by the abundant sigmata in their walls. The ciliated chambers are small—from 0·015–0·018 mm. in diameter, and composed of only a few cells, for the most part about 9 cells may be seen on a cross section.

Oxeas 1·4×0·016 to 3·2×0·048 mm.

Protriænes 2–3 mm. long; cladus 0·03–0·18 mm.

Anatriænes 2·2 mm. long; cladus 0·04–0·08 mm.

Sigmata 0·008–0·009 mm.

Pulau Bidang off the coast of Kedah.

KERATOSA.

27. EUSPONGIA OFFICINALIS ? var. ROTUNDA.

It is fairly evident that a small piece of sponge separately preserved has been cut off from one of two large specimens, though there is no note to that effect. In this more carefully treated piece the ectosome is preserved, while in the whole sponges very little of it remains and the surface consequently has a honeycombed appearance.

Sponge about 50 mm. high, forming a massive circular wall round a small central hollow.

Oscula numerous, 2–6 mm. in diameter.

Conuli 0·88–1·5 mm. apart and about 0·5 mm. high.

Main fibres 0·04–0·08 mm. thick and on an average ·8 mm. apart.

Secondary fibres 0·01–0·03 mm. thick, the most common thickness being 0·02 mm.

Ciliated chambers 0·02–0·03 mm. in diameter.

Aphodal canals 0·015 mm. broad and 0·02–0·03 mm. long.

Colour, in spirit, dark grey externally and pinkish buff within.

Great Redang.

28. STELOSPONGIA sp.

A small sponge growing on a piece of dead coral.

Surface very smooth, with sparse low conuli.

The skeleton is irregular, conspicuously closer-meshed in parts, but it is somewhat difficult to speak of definite fascicles. These smaller meshes measure from 0·3–0·5 mm., while the large ones are about 1·0 mm.

The main fibres measure 0·08–0·12 mm. and have as a rule a dense core of foreign spicules. Occasionally there are large sand-grains at the nodes of the skeleton.

The secondary fibres have a slender axial thread or line of foreign spicules, or sometimes are quite free of spicules.

Great Redang.

29. SPONGELIA DIGITATA, sp. n. (Plate XIV. fig. 4 and Plate XV. fig. 2.)

Sponge attached by a thin encrusting base to a rod-shaped piece of dead coral. From this it rises as a long ridge (50 mm. long) which breaks up distally into flattened, bluntly ending processes, measuring 25×3–10 mm.

Surface covered with low conuli 1–2 mm. apart and 0·2–0·4 mm. in height.

Oscula (?) minute, inconspicuous near the tips of the lobes.

The skeleton consists of a network of very thin fibres, which are not distinguishable into main and secondary, and are uniformly areniferous. They form for the most part square meshes about 0·64 mm. in breadth.

Fibres 0·03–0·06 mm. thick.

The ectosome is a thin layer of cystenchyma, thickest at the tips of the lobes. Only in this layer are spongoblasts obvious.

Spermatozoa are present in various stages and in great abundance.

The ciliated chambers measure ·07 × ·04 mm. on an average.

The whole choanosome is permeated by a filamentous alga (? *Oscillaria spongeliæ*).

Great Redang.

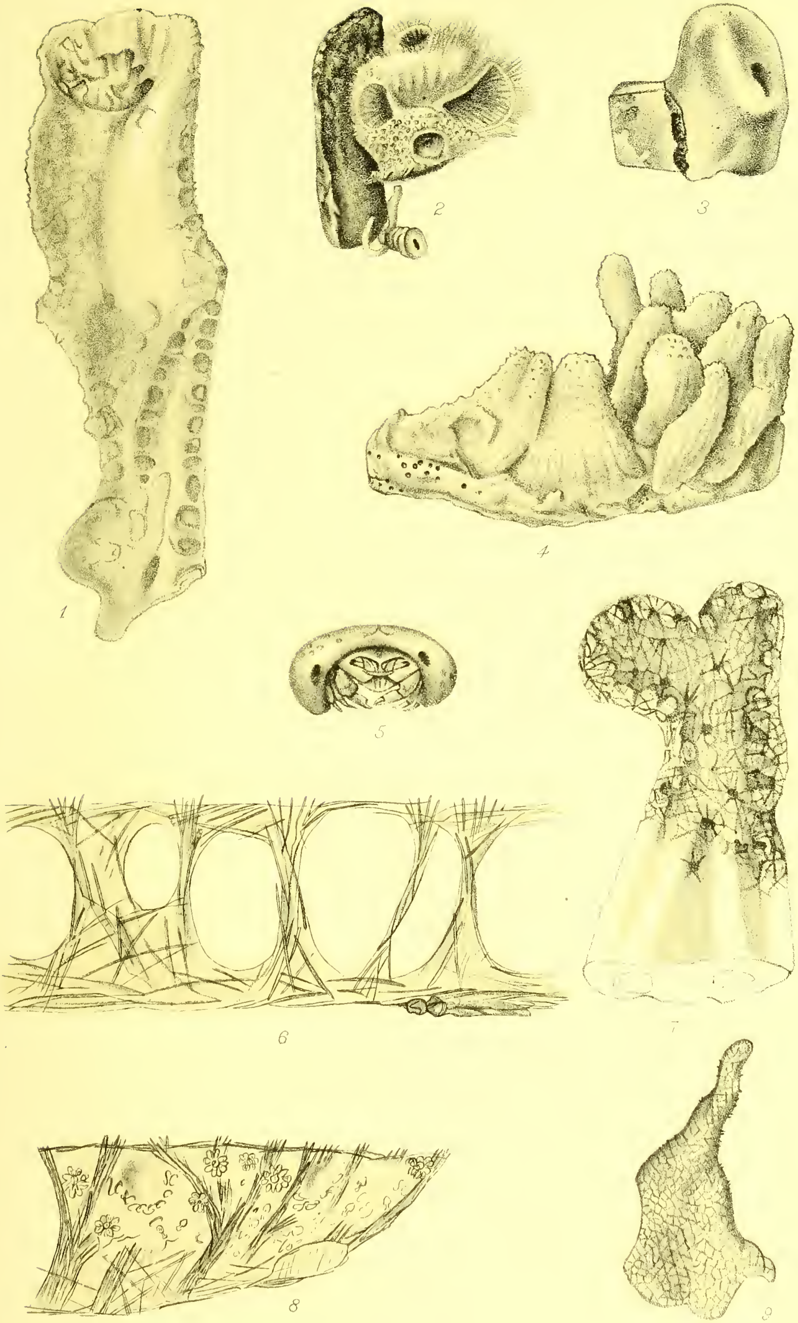
EXPLANATION OF THE PLATES.

PLATE XIV.

Fig. 1. One of the digitiform processes of ***Ciocalypta melichlora***, p. 214. Nat. size.
2. ***Cinachyra malaccensis*** (p. 219), slightly larger than nat. size.
3. ***Spirastrella inconstans*** (p. 216), attached to a fragment of stone. Nat. size.
4. ***Spongelia digitata*** (p. 220), attached to a branch of dead coral. Nat. size.
5. ***Reniera*** sp. 1 (p. 210), growing on a crab. × 2.
6. A section of ***Pseudosuberites cava*** (p. 217). × 15.
7. ***Ciocalypta rutila*** (p. 215), almost the entire specimen. × $\frac{3}{2}$.
8. ***Esperella sulevoidea*** (p. 213), in section. × 20.
9. ***E. sulevoidea*** (p. 213), entire specimen. × $\frac{3}{2}$.

PLATE XV.

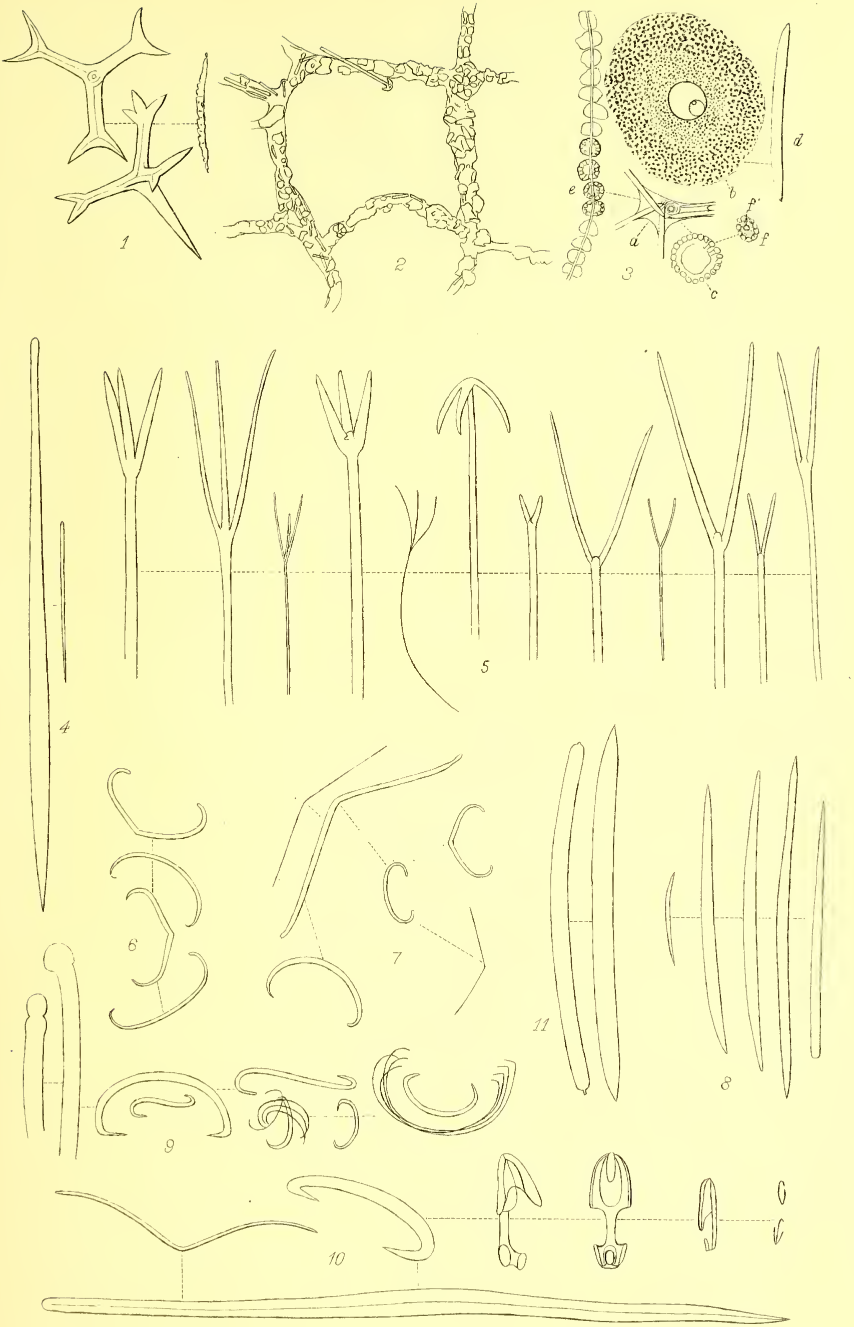
Fig. 1. Microcalthrops and spined microxea of ***Dercitus pauper***, p. 218.
2. One complete mesh of the skeleton of ***Spongelia digitata***, p. 220.
3. ***Reniera*** sp. 5 (p. 211). *a*, node of the skeletal network; *b*, egg; *c*, ciliated chamber; *d*, isolated spicule; *e*, piece of fibre with chaplet-cells; *f*, isolated chaplet-cell; *f′*, its segment of fibre.
4. Spicules of ***Suberites laxosuberites***, p. 217.
5. Megascleres of ***Cinachyra malaccensis***, p. 219.
6. Sigmata and centrangulate sigmata of ***Gellius centrangulatus***, p. 212.
7. Sigmata, toxa, and centrangulate sigmata of ***Gellius sagittarius***, p. 212.
8. Spicules of ***Ciocalypta melichlora***, p. 214.
9. Spicules of ***Biemma democratica***, p. 213.
10. Spicules of ***Esperella sulevoidea***, p. 213.
11. Spicules of ***Reniera*** sp. 2, p. 210.



Elwin Wilson, Cambridge.

SPONGES FROM THE MALAY PENINSULA.

P.Z.S. 1902, vol. II. Pl. XV.



Edwin Wilson, Cambridge.

SPONGES FROM THE MALAY PENINSULA.